

Top Secret



**Industrial Facilities
(Non-Military)**

Basic Imagery Interpretation Report

**Nan-ching Petroleum Refinery
Nan-ching, China**



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Nan-ching Petroleum Refinery is on the south bank of the Chang-chiang (Yangtze River), approximately 10 nautical miles northeast of Nan-ching in Kiangsu Province, China. Crude oil to charge the refinery is produced at the Sa-erh-tu Oil Field in northeast China (see Figure 1). The crude oil is transported to the refinery by tankers from Lu-ta. ^{1/} Rail service to the refinery is provided by a spur off the line between Nan-ching and Chen-chiang. Electric power is received through a transformer substation at the refinery, and steam is provided by a collocated steam plant. A thermal power plant is under construction on the western edge of the refinery.

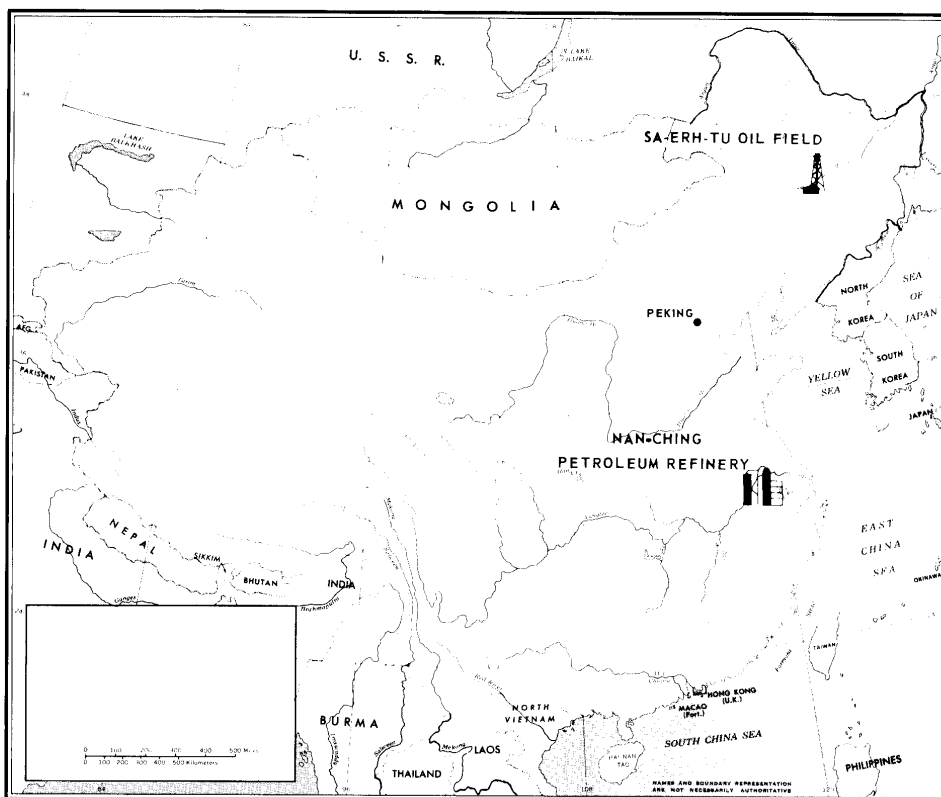


FIGURE 1. LOCATION MAP.

BASIC DESCRIPTION

The refinery is walled except for the western part where the plant is being expanded. The refinery is irregular in shape and occupies about 450 acres (see Figures 2 and 3).

Operational Functions

The main processing units at the refinery are a crude oil distillation unit, a thermal cracking unit, a delayed coking unit, a catalytic reforming-hydrotreating unit, and a catalytic cracking unit. A probable gas fractionation unit is being added adjacent to the vapor recovery section of the catalytic cracking unit. This unit will separate the gases produced in the catalytic cracking unit. Other processing units are a blending/treating unit, a probable blending/treating unit, a probable hydrotreating unit, and three unidentified secondary processing units.

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The main product of the refinery is gasoline in a wide range of octane ratings. Other products include kerosene, diesel and fuel oils, petroleum coke, and gaseous hydrocarbons. The aromatics -- benzene, toluene, and xylene -- are produced in the catalytic reformer-hydrotreater. They may be separated from the reformed gasoline or left in the gasoline as high octane components. Some hydrotreating of products, such as diesel or fuel oils, may also occur using the surplus hydrogen produced in the reformer.

Construction and Operational Status

In March 1962, on the earliest photography of the plant area, preliminary grading of the refinery area was observed near an existing POL storage area. (The storage tanks in this POL storage area were removed between July 1964 and March 1966.) Although very little work was done on the refinery between March 1962 and April 1963, construction progressed rapidly between April 1963 and June 1964. The refinery appeared to be operational in October 1965 but was not observed operating until March 1966.

Between May and December 1970, a furnace and two or three probable desalting drums were added to the crude oil distillation unit, probably resulting in an increase in the capacity of the unit. The capacity of the delayed coking unit was increased between December 1970 and February 1972 by the addition of two coking drums and a furnace to the existing two drums and furnace. Between April 1971 and November 1972, a tall column and its associated equipment were added to the catalytic reforming-hydrotreating unit. This column may be for separation of some of the aromatics produced in the reformer. The construction chronology for the refinery is shown in Figure 4.

Functional Description

Table 1 lists the functional areas within the refinery and contains measurements of storage tanks in storage areas. All measurements are rounded to the nearest 5 feet.

TABLE 1. Facilities at Nan-ching Petroleum Refinery
(Keyed to Figure 3)

Area	Functional Description	Remarks	Area	Functional Description	Remarks
A	Products Shipment	Products are shipped out by barrel from this pier.			(BTX) separation may also occur in this unit.
B	Unidentified Processing		F	Storage	Area contains 22 cylindrical storage tanks:
C	Storage and Shipping	Area contains 73 cylindrical storage tanks: 2 160-foot-diameter 2 135-foot-diameter (1 semiburied) 6 95-foot-diameter 9 75-foot-diameter (1 semiburied) 2 70-foot-diameter (1 semiburied) 3 60-foot-diameter (2 semiburied) 10 55-foot-diameter 5 50-foot-diameter 11 40-foot-diameter (7 semiburied) 4 35-foot-diameter (all semiburied) 6 30-foot-diameter (1 semiburied) 2 25-foot-diameter (both semiburied) 2 20-foot-diameter 5 10-foot-diameter Four large semiburied tanks could not be measured. One storage tank is under construction.			1 95-foot-diameter 3 75-foot-diameter 2 40-foot-diameter 2 35-foot-diameter 12 30-foot-diameter 2 20-foot-diameter
			G	Blending/Treating	
			H	Unidentified Processing	
			I	Delayed Coking	The unit has 4 coking drums. Two of the drums were added between December 1970 and February 1972.
			J	Shipping	Area contains 3 railcar loading racks.
			K	Storage	Area contains 16 cylindrical storage tanks: 2 75-foot-diameter 8 65-foot-diameter 2 55-foot-diameter 2 40-foot-diameter 2 30-foot-diameter
			L	Thermal Cracking	This is one of the last thermal cracking units built in China.
D	Catalytic Cracking	This is the standard catalytic cracking unit being constructed in China. The addition under construction adjacent to the vapor recovery section is probably for fractionation of the gas produced in the cracking process. Similar additions are being made to a few other catalytic cracking units at Chinese refineries.	M	Crude Oil Distillation	This is the standard crude oil distillation unit being built in China. Its capacity was probably increased in 1970.
			N	Probable Gas Fractionation	This unit probably separates gases produced in the thermal cracking unit.
			O	Unidentified Processing	
E	Catalytic Reforming-Hydrotreating	This unit contains more columns than are necessary for reforming and hydrotreating of reforming feedstocks. Therefore, some aromatics	P	Probable Hydrotreating	This unit probably uses excess hydrogen from the catalytic reforming unit to treat some products of the distillation and cracking units.
			Q	Probable Blending/Treating	

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AREA	DESCRIPTION	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
A	PRODUCTS SHIPPING												
B	UNIDENTIFIED PROCESSING												
C	STORAGE AND SHIPPING												
D	CATALYTIC CRACKING												
E	CATALYTIC REFORMING-HYDROTREATING												
F	STORAGE												
G	BLENDING/TREATING												
H	UNIDENTIFIED PROCESSING												
I	DELAYED COKING												
J	SHIPPING												
K	STORAGE												
L	THERMAL CRACKING												
M	CRUDE OIL DISTILLATION												
N	PROBABLE GAS FRACTIONATION												
O	UNIDENTIFIED PROCESSING												
P	PROBABLE HYDROTREATING												
Q	PROBABLE BLENDING/TREATING												

LEGEND

-  UNDER CONSTRUCTION
-  COMPLETE
-  EXPANSION

FIGURE 4. CONSTRUCTION CHRONOLOGY, NAN-CHING PETROLEUM REFINERY, CHINA.

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REFERENCES

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Map

8th RTS. US Air Target Chart, Series 200, Sheet M0386-23HL, 5th ed., Sep 72.

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Requirement

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Support Number 440015 EN

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